MONTANA DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES
Communicable Disease Control & Prevention Bureau
Food & Consumer Safety Section

2005 MONTANA SPORT FISH CONSUMPTION GUIDELINES

Fish is an excellent source of food for people. It is known that fish provide high quality protein which contributes to a healthy diet. Studies have shown that eating fish regularly can play a significant role in reducing the incidence of heart disease. Scientists suggest that fish oil reduces cholesterol levels in our blood and improves our health in other ways, too.

The safety of our fish as a food source, however, is challenged by chemical contaminants in our environment. Across the nation, chemical contamination from both manmade and natural sources appear in waterbodies and can accumulate in fish tissues. In certain situations, consumption of fish may pose health risks to humans.

The **Montana Fish Consumption Advisory** has meal guidelines for fish from lakes and rivers that have been tested for contaminants from over 20 locations in Montana. There have not been any known cases of illness from eating fish caught in Montana. This advisory offers advice on how fish caught in Montana can be safely eaten. It is not intended to discourage anglers from eating fish, but should be used as a guide for choosing fish which are low in contaminants.

General Guidelines to Reduce Your Health Risk

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Keep smaller fish for eating. In addition to tasting better, younger, smaller fish have had less time to accumulate contaminants than older, larger fish. Selection of only smaller fish for the table reduces risk to your health.

Eat smaller meals when you eat big fish and eat them less often. Freeze part of your catch to space the meals out over time.

Eat fish that are less contaminated. Substitute a few panfish meals for the walleye and lake trout you might otherwise eat. Contaminants such as mercury and PCB's build up in large predatory fish. Their prey, such as perch, have less contaminants.

Clean and cook your fish properly. Certain contaminants accumulate in fatty areas of the fish. Trim fish to remove fatty portions. Cook fish such that juices drain away from the meat.

High-risk individuals – Young children, nursing mothers, and childbearing women are at greatest risk of adverse health effects. Such persons should be especially concerned about fish eating habits. See Fact Sheet D for additional details.

Using the Advisory

1. Determine the species and length of your fish.

2. Refer to Table 1 for the lake or river in which your fish was caught; the waterbodies are listed in alphabetical order.

> If your fishing location is **NOT** listed in Table 1, follow the above **General Guidelines to Reduce Your Health Risk**. If your fish or fishing location **IS** listed in Table 1, it does not necessarily mean that the fish or water is polluted, only that the fish have been tested for contaminants. Meal advice will depend on whether a contaminant was found and on the concentration of the contaminant.

3. Note the mercury and PCB concentrations listed for the species and size of your catch.

4. Refer to Table 2 for advice on eating fish that contain mercury at levels listed.

5. Refer to Table 3 for advice on eating fish that contain PCB levels found in your catch.

Mercury

Mercury is widespread in the environment and low concentrations naturally occur in soils. These deposits and other sources such as emissions from coal fired power plants cause elevated levels of mercury in fish in Montana. For information on other sources of mercury see Fact Sheets A & B below. Mercury accumulates in food chains and in predator fish. Some species accumulate levels which are a health concern. Although mercury can damage an adult's nervous system, it's most severe effects are on developing fetuses in pregnant women. This is why it is especially important that pregnant women, nursing mothers, women who may become pregnant in the next several years, and children under age six follow the recommendations in this advisory. The first symptoms of poisoning include incoordination and a burning or tingling sensation in the fingers and toes. As mercury levels increase, your ability to walk, talk, see and hear may all be affected in subtle ways. Meal guidelines from the Montana Department of Public Health & Human Services are intended to protect against any symptoms of mercury poisoning.

PCB's

Poly-chlorinated Bi-phenyls, also known as PCB's, when present in waterbodies, are generally found downstream from cities. Levels of PCB's have dropped since the production of these industrial chemicals were banned in 1976, but they continue to persist in the environment. PCB's may damage infants and developing fetuses in pregnant women. The consumption advice for PCB's is intended to protect children from developmental problems. PCB's may also cause changes in human blood, liver and immune function of adults. In addition, PCB's cause cancer in laboratory animals and may cause cancer in humans. Currently, cancer will affect about one in every three people in Montana. The EPA estimates that only [1] one additional case of cancer may develop in one person of 2,500 to 10,000 people eating PCB-contaminated fish for 70 years.

For additional information on how to prepare fish in such a way as to minimize PCB contamination in the edible fish, contact the Montana Food & Consumer Safety Section at 406–444-5306 for a free EPA brochure titled “A GUIDE TO HEALTH EATING OF THE FISH YOU CATCH”.

Table 1. LABORATORY TEST RESULTS:
MERCURY AND PCB'S IN FISH IN MONTANA
(CONCENTRATION EXPRESSED IN MICROGRAMS PER GRAM OF FISH)

Waterbody	Fish species	Size range (inches)	Conc. µg/g Hg[1]	PCB
Bighorn Lake Bighorn County	Walleye	9.8 - 15.1	0.20	nd2
		19.2 - 20.7	0.58	nd
		27.0 - 27.5	1.40	nd
Big Spring Creek Fergus County	Rainbow trout	6.9 - 11.9	nd	0.07
		12.7 - 14.0	nd	0.16
		14.2 - 16.3	nd	0.24
Bynum Reservoir Teton County	Walleye	7.7 - 11.0	0.38	nd
		14.2 - 16.9	0.56	nd
		17.5 - 19.0	0.37	nd
Canyon Ferry Reservoir Broadwater County Lewis & Clark County	Rainbow trout	8.9 - 12.5	0.11	nd
		14.7 - 17.4	0.11	nd
		18.2 - 19.7	0.14	nd
	Yellow perch	5.2 - 6.9	0.10	nd
		7.0 - 9.3	0.11	nd
		9.4 - 11.6	0.20	nd
	Burbot	14.8 - 17.7	0.18	nd
	Walleye	8.8 - 16.9	0.17	nd
		17.3 - 22.2	0.34	nd
		24.6 - 27.8	0.50	nd
Clark Canyon Reservoir Beaverhead County	Rainbow trout	11.6 - 15.9	0.08	nd
		17.0 - 19.4	0.12	nd
		20.2 - 22.8	0.16	nd
	Burbot	26.2 - 27.1	0.07	nd
Cooney Reservoir Carbon County	Rainbow trout	7.6 - 9.2	0.07	nd[2]
		11.7 - 12.9	nd	nd
		12.9 - 13.7	nd	nd
	Walleye	8.8 - 13.1	0.30	nd
		16.7 - 22.2	0.39	nd
		25.6 - 27.4	0.37	nd
Crystal Lake Fergus County	Cutthroat Trout	6.0 - 10.0	0.13	nd
		10.0 - 4.0	0.16	nd
		14.0 - 18.0	0.16	nd
Flathead Lake Flathead County & Lake County	Lake trout	18.0 - 26.7	0.33	0.08
		27.6 - 32.1	0.70	0.16
		32.2 - 38.8	0.91	0.38
	Lake Whitefish	11.4 - 14.1	0.12	nd
		15.2 - 17.7	0.18	nd
		17.9 - 18.9	0.22	nd

Table 1. (Continued) LABORATORY TEST RESULTS:
MERCURY AND PCB'S IN FISH IN MONTANA
(CONCENTRATION EXPRESSED IN MICROGRAMS PER GRAM OF FISH)

Waterbody	Fish species	Size range (inches)	Conc. µg/g Hg[1]	PCB
Fort Peck Reservoir Valley, Garfield and Phillips County	Walleye	8.8 - 14.9	0.28	nd
		15.1 - 20.8	0.35	nd
		21.7 - 27.3	0.58	nd
	Northern pike	20.8 - 24.9	0.03	nd
		26.8 - 32.8	0.41	nd
		34.3 - 36.0	0.57	nd
	Lake trout	24.7 - 28.5	0.28	nd
		28.9 - 32.0	0.53	nd
	Chinook Salmon	28.5 - 33.6	0.49	nd
Fresno Reservoir Hill County	Walleye	9.1 - 14.0	0.16	nd[2]
		14.5 - 17.3	0.27	nd
		>17.3	0.75	nd
Georgetown Lake Granite & Deer Lodge Counties	Brook trout	10.7 - 12.5	0.10	nd[2]
		12.8 - 15.0	nd	nd
		15.8 - 15.9	nd	nd
	Kokanee	11.7 - 13.3	0.05	nd
Hauser Reservoir Lewis & Clark County	Kokanee	6.3 - 7.1	0.05	nd
		11.5 - 13.0	0.05	nd
		16.9 - 20.6	0.19	nd
	Rainbow trout	10.4 - 12.1	0.10	nd
		15.9 - 17.6	nd	nd
	Yellow perch	5.3 - 7.7	nd	nd
		8.1 - 10.1	nd	nd
		11.1 - 14.4	0.14	n
Hebgen Lake Gallatin County	Brown trout	11.2 - 13.8	0.17	nd
		14.7 - 17.7	0.26	nd
		19.2 - 25.6	0.60	nd
Holter Lake Lewis & Clark County	Kokanee	10.5 - 14.0	0.09	nd
		15.8 - 16.6	0.09	nd
		19.5 - 22.1	0.38	nd
	Rainbow trout	12.6 - 13.5	0.08	nd
		14.0 - 17.5	0.07	nd
		17.7 - 19.5	nd	nd
	Walleye	12.0 - 19.5	0.25	nd
		19.7 - 24.1	0.32	0.08
		25.0 - 26.7	0.40	0.05
	Yellow perch	8.2 - 10.0	0.19	nd
		10.4 - 11.9	0.26	nd

Table 1. (Continued) LABORATORY TEST RESULTS:
MERCURY AND PCB'S IN FISH IN MONTANA
(CONCENTRATION EXPRESSED IN MICROGRAMS PER GRAM OF FISH)

Waterbody	Fish species	Size range (inches)	Conc. µg/g Hg[1]	PCB
Island Lake Lincoln County	Yellow perch	6.0 - 10.0	0.22	nd
Lake Frances Pondera County	Walleye	12.4 - 14.0	0.45	nd
		16.0 - 17.8	0.75	nd
		18.4 - 20.8	0.91	nd
Lake Koocanusa Lincoln County	Burbot	14.2 - 16.1	0.10	nd
		19.1 - 21.3	0.25	nd
	Kokanee	9.3 - 11.9	0.13	nd
		12.8 - 14.0	0.11	nd
		14.1 - 15.2	0.11	nd
Lake Mary Ronan Lake County	Rainbow trout	13.2 - 15.2	nd	nd
		15.5 - 16.6	nd	nd
	Kokanee	8.7 - 9.7	0.22	nd
		9.9 - 10.9	0.13	nd
		10.7 - 12.0	0.13	nd
Martinsdale Reservoir Meagher & Wheatland Counties	Brown trout	20.4 - 30.4	0.26	nd
		9.6 - 12.2	0.11	nd
	Rainbow trout	14.8 - 16.2	0.13	nd
		16.6 - 17.0	0.12	nd
Milltown Reservoir Missoula County	Northern Pike	4.0 - 18.0	0.04	nd
		18.0 - 22.0	0.04	nd
		22.0 - 26.0	0.04	nd
Nelson Reservoir Phillips County	Walleye	14.0 - 17.5	0.13	nd
		19.0 - 20.6	0.16	nd
		22.1 - 23.2	0.64	nd
		24.5 - 26.0	0.67	nd
	Northern pike	24.0 - 26.1	0.15	nd
Park Lake Jefferson County	Arctic Grayling	6.0 - 10.0	0.01	nd
	Cutthroat trout	6.0 - 10.0	0.01	nd
		10.0 -14.0	0.01	nd
Seeley Lake Missoula County	Rainbow trout	18.2 - 20.1	nd[2]	0.06
	Mountain whitefish	9.3 - 10.4	nd	nd
		10.6 - 11.1	0.08	nd
		11.2 - 11.6	0.10	nd
Silver Creek[4] (near Helena)	Cutthroat trout Catch & Release)	12.7	1.6	--[3]
		17.1	3.1	--
		18.7	3.0	--

Table 1. (Continued) LABORATORY TEST RESULTS:
MERCURY AND PCB'S IN FISH IN MONTANA
(CONCENTRATION EXPRESSED IN MICROGRAMS PER GRAM OF FISH)

Waterbody	Fish species	Size range (inches)	Conc. µg/g Hg[1]	PCB
Swan Lake Lake County	Kokanee salmon	7.5 - 11.2	0.06	nd
		12.2 - 12.9	0.07	nd
		14.3 - 17.7	0.08	nd
	Bull trout	11.3 - 17.0	0.10	nd
		17.8 - 19.5	0.12	nd
		19.6 - 23.2	0.10	nd
	Northern Pike	22.0 - 25.6	0.22	nd
		38.3	0.53	nd
Tiber Reservoir (Lake Elwell) Liberty Co.	Walleye	9.5 - 10.7	0.23	nd[2]
		10.9 - 14.4	0.54	nd
		16.9 - 19.7	0.78	nd
Tongue River Reservoir Bighorn County	Walleye	10.2 - 12.9	0.13	nd
		16.1 - 22.5	0.26	nd
		25.0 - 26.4	0.46	nd
	Northern pike	24.9 - 26.2	0.17	nd
		28.2 - 30.0	0.30	nd
Willow Creek Reservoir (Harrison Lake) Madison County	Rainbow trout	8.1 - 13.4	0.06	nd
		15.2 - 17.7	0.06	nd
		17.9 - 19.3	0.08	nd
Whitefish Lake Flathead County	Lake trout	14.8 - 18.2	0.24	nd
		19.4 - 22.7	0.32	nd
		24.0 - 26.6	0.42	0.069
	Northern Pike	26.2 - 30.1	0.32	nd[2]

[1] Hg is the scientific abbreviation for **mercury**.
[2] "nd" means **None Detected**.
[3] Indicates that no fish were collected. Data are not available, and no consumption advice is issued.
[4] Closed to harvest; catch & release only.

For more information:

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For further information or details on the collection and laboratory testing of fish in Montana, call the Montana Department of Fish, Wildlife and Parks at (406) 444-2449.

Table 2. MEAL GUIDELINES FOR CONSUMPTION OF MERCURY-CONTAMINATED FISH

Shaded areas indicate mercury levels for which a consumption advisory is in effect.
For risk Group 1, meal size is 8 oz. of cleaned fish (wet weight, before cooking).
For risk Group 2, meal size is 6 oz. of cleaned fish (wet weight, before cooking).

Risk Group[2]	Exposure Duration[3]	Mercury level in Fish in parts per million (µg/g)					
		nd - 0.09	0.10 - 0.16	0.17- 0.65	0.66-1.00	1.01 - 2.80	2.81 - 4.5
GROUP 1: **Adult Men & Adult Women above child-bearing age[1]**	Vacation	Unlimited	Unlimited	Unlimited	4 meal/mo	1 meal/wk	1 meal/mo
	Seasonal	Unlimited	Unlimited	2 meal/wk	2 meal/mo	2 meal/mo	**Don't eat**
	Annual	Unlimited	Unlimited	1 meal/wk	1 meal/mo	1 meal/mo	**Don't eat**
GROUP 2: **Women of Child-bearing age[2], Children 6 & under, Nursing Mothers**	Vacation	Unlimited[4]	Unlimited[4]	1 meal/wk	1 meal/mo	1 meal/yr	**Don't eat**
	Seasonal	Unlimited[4]	2 meal/wk[4]	2 meal/mo	1 meal/yr	**Don't eat**	**Don't eat**
	Annual	Unlimited[4]	2 meal/wk[4]	1 meal/mo	**Don't eat**	**Don't eat**	**Don't eat**

[1] For Group 1, one meal is considered to be 8 oz of cleaned fish (wet weight-before cooking). See Fact Sheet D for additional information.

[2] If you may become pregnant in the next year or two, are pregnant, or you are a nursing mother, you and your children under 6 years of age are especially sensitive to the effects of mercury. See Fact Sheet D for information on commercial fish and meal size.

[3] If you eat sport-caught fish for 1 to 3 weeks out of the year, use the advice shown for **VACATION**. If you eat sport-caught fish regularly for 1 month to 3 months of the year, use the advice shown for **SEASONAL**. If you eat sport-caught fish regularly 4 or more months of the year, use the advice shown for ANNUAL.

[4] Two–6 ounce meals per week of any species of fish is the maximum recommendation for pregnant women, young children, nursing mothers, and other women of child bearing ages. This includes fish from all sources. See Fact Sheet D for information on commercial fish and meal size**.**

Table 3. MEAL GUIDELINES FOR CONSUMPTION OF FISH CONTAMINATED WITH PCB'S

PCB concentration in parts per million (µg/g)	BELOW 0.025	0.025 - 0.10	0.11 - 0.47	ABOVE 0.47
Meal[1] Advice	unlimited	1 meal/wk	1 meal/mo	Don't eat

[1] One meal for men is considered to be 0.5 lbs of cleaned fish (8 oz wet-weight before cooking). One meal for women and children 6 & under is considered to be 6 oz. (wet-weight before cooking).

The Montana Department of Public Health & Human Services and the Montana Department of Fish, Wildlife and Parks will be conducting additional tests on fish from Montana waters. This advisory will be updated as additional information becomes available.

For More Information:

For more information on the health risks/benefits of fish consumption, or related information, see the fact sheets below, or call the Montana Food, Drug & Cosmetic Program at (406) 444-5306.

For information on the collection and laboratory testing of fish in Montana, call the Montana Department of Fish, Wildlife and Parks at (406) 444-2449.

Fact Sheet A

Facts About Montana Fish

What contaminants are found in Montana fish?

Mercury is a naturally occurring element which is widespread in our environment. It can be found in low concentrations in many soils and rocks. Mercury may also enter Montana water from household discards, batteries, switches, wastes from mining, industrial wastes, and from burning fossil fuels. Coal fired power plants both inside and outside Montana are considered a source of airborne mercury. More details on the possible sources of mercury are found below in Fact Sheet B.

Mercury recycles between land, water, and air and enters plant and animal tissue. A form known as **methyl mercury**, with known toxicities, accumulates in food chains.

Poly-chlorinated Bi-phenyls (PCB's) Fish in some Montana lakes and rivers have been found to contain **PCB's**. These synthetic oils have had many uses, and are found in electrical transformers, cutting oils, and carbonless paper. Although they were banned in 1976, they do not decompose easily and remain in the water and lake sediments for years. PCB levels in Montana's waters are slowly decreasing as PCB's move downstream with river sediments or are buried on lake bottoms. Data which has been collected on PCB's in Montana fish is used for the fish consumption guidelines issued by the department.

Other Contaminants can reach rivers and lakes from local sources such as improperly stored wastes and abandoned dumps along with PCB's and methyl mercury. If a local source is identified, it may be possible to clean it up and decrease the contamination of the lake or river. However, contaminants can reach remote and pristine lakes from the atmosphere. The sources for much of the contamination which concern us today are not known and may be from beyond Montana's borders.

Other metals, pesticides, and organic compounds may be present in Montana fish but it has not been established that there is a known health concern as of the time of this printing. As indications of other contaminants becomes available, additional parameters may be monitored.

You can obtain data for any state which is collecting and reporting data by using EPA's website - **http://www.epa.gov/OST/fish**

For more information:

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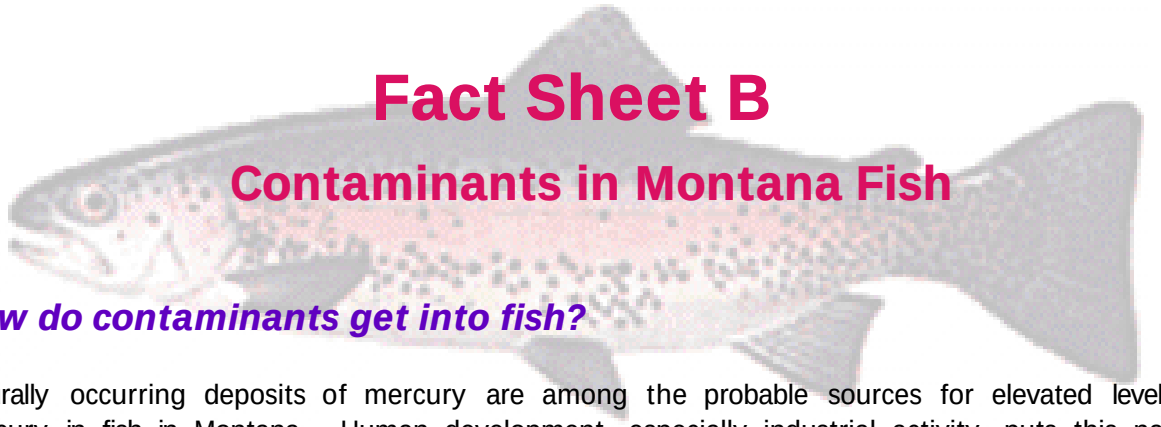
On the health risks of contaminants, or for copies of the current Montana Fish Consumption Advisory, contact the Montana Department of Public Health and Human Services, Food & Drug Program Office at (406) 444-5306.

On the sources of contaminants in Montana's waters, contact the Montana Department of Environmental Quality, Monitoring and Data Management Bureau at (406) 444-3554, or the Water Protection Bureau at 444-3080.



Fact Sheet B

Contaminants in Montana Fish

How do contaminants get into fish?

Naturally occurring deposits of mercury are among the probable sources for elevated levels of mercury in fish in Montana. Human development, especially industrial activity, puts this natural element into the air, water, and biota. Coal fired power plants, including those outside Montana's borders are another probable source of mercury. Other sources include mercury containing button batteries, mercury switches in electrical appliances, thermostatic controls in homes, mercury vapor lamps, flourescent lighting, detergents, photographic chemicals, neon colored lamps (most colors contain mercury except red, orange and pink), thermometers, thermostat probes for ovens, medical equipment (i.e. blood pressure cuffs), medical supplies, and many other sources. Replacement and recycling of these items is recommended–do not discard these items into the sewer or garbage collection systems. For information on proper disposal recommendations, contact the Montana Department of Environmental Quality and your local recycling program. The complete story about sources of mercury in Montana's waters is a matter which needs much further study.

Once in a lake, mercury is converted to methyl mercury by bacteria and other processes. Fish absorb methyl mercury from their food and from water as it passes over their gills. Mercury is tightly bound to proteins in all fish tissue, including muscle (edible fish flesh). There is no method of cooking or cleaning fish which will reduce the amount of mercury in a meal.

There are no known natural sources of PCB's–all sources are related to commercial manufacturing, storage and disposal of items containing PCB's. Decades ago, PCB's were widely used in Montana in electrical transformers. Manufacturing of these chemicals was stopped in 1976, but the chemicals are highly persistent in the environment, and can still be found in the sediments of lakes and streams. PCB's are not soluble in water but are highly fat soluble. Fish absorb PCB's and dioxin from water, suspended sediments, and food. PCB's and dioxin concentrate in the fat of fish, as well as other animals. Cleaning and cooking a fish to remove fat will lower the amount of PCB's or dioxin in a fish meal.

Larger, older fish and especially predator fish such as Walleye and Lake Trout which feed on other fish accumulate more contaminants than smaller, younger fish which eat less contaminated prey. Contaminants are not usually detected in panfish such as bluegill, crappies, small stream caught brook trout, cutthroat and others. See Fact Sheet D for general consumption advice.

For more information:

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On the health risks of contaminants, contact the Montana Department of Public Health and Human Services, Food & Drug Program Office at (406) 444-5306.

On the sources of contaminants in Montana's waters, contact the Montana Department of Environmental Quality, Monitoring and Data Management Bureau at (406) 444-3554.

Fact Sheet C
Facts About Fish Monitoring

How do Montana's fish compare with other states?

Many states have comprehensive sampling programs to determine if sport fishes are contaminated with pollutants. Montana began such a testing program in 1994. Additional sites were added in 1999 and 2000. The data gathered for Montana are for "still" waters primarily, (lakes/reservoirs), and data were gathered for many of the sites which were suspected of being contaminated.

Mercury (methyl mercury) is a "global pollutant". Over 30 states and 2 Canadian Provinces presently issue advisories because of mercury contaminated freshwater fishes. Thirty-three states issue advisories because of PCB's in fishes. Not all states use the same threshhold values for issuing advisories, and the data is not comparable. Some states do not monitor in the way that Montana has done, and do not issue advisories.

The levels of contaminants found in Montana fishes were generally low, but fish in some locations contained levels that are of concern for those eating the fish on a frequent or prolonged basis. One example is Silver Creek northwest of Helena, which is limited to "catch and release" fishing. For all other bodies of water, you can generally regard Montana's Brook Trout, Rainbow Trout, Cutthroat Trout, Perch and small panfish as being low in contamination, including mercury. These species average less than 0.15 ppm of methyl mercury. For the sake of comparison, commercially available canned tuna averages 0.17 to 0.20 parts per million of methyl mercury. That is a higher level of methyl mercury than virtually any rainbow trout or kokanee salmon in Montana lakes and reservoirs. Overall the levels of contaminants found in Montana fishes are lower than many other states with similarly collected data for the same species. More detail is contained in Fact Sheet D.

There are some predator species in Montana which tend to accumulate mercury and PCB's through a lifetime of eating smaller fish. Among the Montana species which are likely to be generally higher in mercury and PCB's are the larger Lake Trout, Walleye, and Northern Pike.

Many commercially available fish will meet federal standards for food safety, yet not meet guidelines for fish that can be eaten in unlimited quantities. In short, seafood from stores or restaurants may have as much or more methylmercury and PCB's than Montana's sport fish. You can make your own comparisons. See Fact Sheet D for further information regarding commercial fish, and the most heavily contaminated Montana fish. The MONTANA FISH CONSUMPTION ADVISORIES can be found on the web, at:

http://www.dphhs.state.mt.us/hpsd/pubheal/healsafe/pdf/fish.pdf

For more information:

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For more information regarding mercury in commercial fish, you can check out FDA's advisory at:

http://vm.cfsan.fda.gov/~dms/mercury.html

For information on the collection and laboratory testing of fish in Montana, call the Montana Department of Fish, Wildlife and Parks at (406) 444-2449.

Fact Sheet D
Eating Fish: Health Risks and Benefits

The Montana Department of Public Health/Human Services has issued this advisory to assist people is choosing the best and safest fish to eat. The department also issues consumption advice based on the nutritional benefits of eating fish. We recommend that pregnant women eat at least 12 ounces of fish per week so that adequate nutritional benefits are derived. As a substitute for fish, omega-3 fatty acid capsules may meet your nutritional requirments--consult with your physician. By using the advisory, sport caught fish can be a part of your diet, and mercury contamination can be minimized.

What are the health risks of eating contaminated fish?

PCBs, dioxin and methylmercury build up in your body over time. It may take months or years of regularly eating contaminated fish to accumulate levels which are a health concern. Small amounts of methyl-mercury can be safely eliminated but larger amounts may cause damage to the nervous system of small and unborn children–a developing fetus is especially sensitive to mercury poisoning. The first symptoms of poisoning include incoordination and a burning or tingling sensation in the fingers and toes. As mercury levels increase, your ability to walk, talk, see, and hear may all be affected in subtle ways. It is recommended that women of childbearing ages avoid those species of fish and seafood known to be associated with elevated levels of mercury. Meal guidelines from the Department are intended to protect you from the first symptoms of mercury toxicity.

Exposure to PCBs is linked to infant development problems in children whose mothers were exposed to PCBs before becoming pregnant. The consumption advice for PCBs is intended to protect children from developmental problems and damage to their immune system. PCBs also cause changes in human blood, liver and immune function of adults. In addition, PCBs cause cancer in laboratory animals and may cause cancer in humans. Currently, cancer will affect about one in every two people in Montana primarily due to smoking, diet, exposure to harmful chemicals, and hereditary risk factors. If you follow the meal guidelines in the advisory over your lifetime, the PCBs in the fish you eat may not change your cancer risk at all. At worst, Environmental Protection Agency estimates are that one additional cancer case may develop in 1 of 2,500 to 10,000 people eating PCB-contaminated fish for 70 years.

What about the health benefits of eating fish?

Fish provide a high protein, low fat diet which is low in saturated fats and which provides known health benefits. Many researchers suggest that a half-pound of fish a week in the diet is beneficial in preventing heart disease. Omega-3 fatty acids and other mono- & poly-unsaturated fats are important nutrients found in fish which are helpful in the development of healthy nerve tissue in unborn children. It has been clearly shown that fish of almost any species--lean or fat--may have substantial health benefits when they replace a high fat source of protein in the diet. Fish contain some nutrients which make them especially beneficial in the prevention of birth defects and to assist in the healthy development of young children. For this reason, there is special advice for women of child-bearing ages.

Montana Department of Public Health and Human Services meal guidelines are based on an eight ounce serving (weight before cooking) for a 150-pound man, and a 6 oz serving size for women of childbearing ages. Many women and children often eat smaller portions of fish in the area of 4 to 6 oz per serving. Nutritionists recommend that women of childbearing age eat 3 to 6 ounces of fish in a meal. If fish contain contaminants, it is prudent to space the allowable servings of fish out over longer periods; for example, eat two smaller meals of fish twice a week rather than one large meal of fish once each week.

What is the guideline for pregnant women or nursing mothers?

Women in their childbearing years should realize that it takes 5 to 6 years to rid your body of PCB's and 12 to 18 months to significantly reduce your body burden of methyl mercury. If you are wise about the fish you eat today, you will be protecting your baby of tomorrow. We recommend that women of childbearing age should eat **no less** than 2 meals of fish per week, based on an estimated meal size of 6 oz per meal. Eating 2 meals per week provides significant benefits while not increasing the risks. Some women enjoy fish and seafood and wish to eat more than 2 meals per week. There is no harm for pregnant women or nursing mothers in eating up to four servings of fish in a given week if the chosen fish are those known to be low in mercury and PCB's. See the chart below.

What commercially available fish should women of child-bearing age avoid?

Fish from oceans, estuaries and inland waters may contain mercury and PCBs as well as other contaminants. Fish available in food stores and restaurants are subject to inspection and regulation, but even so, over half of our commercially available swordfish show levels above 1.0 ppm of methyl mercury and range up to 2.4 ppm *(Consumer Reports, 03/09/2001)*. For details see the chart below.

What Montana Fish should a woman of childbearing age avoid?

Lake Trout, Northern Pike and Walleye, especially the larger Walleye (over 15 inches in length) tend to accumulate higher levels of methyl mercury in Montana (0.24 – 1.40 ppm). These fish should not be eaten by women of childbearing ages, nursing mothers, or children 6 and under.

Consumption Guidelines for Women of Child-bearing Ages

	AVOID	ONE 4 TO 6 OZ MEAL PER WEEK	UP TO TWO 6 OZ MEALS PER WEEK	UP TO FOUR 6 OZ MEALS PER WEEK
Commercial and Ocean Fish	shark, sword-fish, king mackerel, or tilefish (golden bass or golden snapper)	tuna steaks, red snapper, marlin, bluefish, grouper, northern lobster, sea bass, grouper, halibut, imported pollock (foreign)	canned tuna, crab, haddock, cod, spiny lobster, mahi-mahi, U.S. pollock, whitefish, haddock, imitation crab meat (surimi)	salmon (canned or fresh), perch, tilapia, shrimp, cod, scallops, crappie, cat-fish, flounder/sole, clams, oysters; farm-raised trout, U. S. hake
Montana Sport-Caught Fish	lake trout, northern pike, walleye over 15 inches in length;	*walleye under 15 inches in length, burbot, bass	perch, brown trout, lake whitefish,	rainbow trout, salmon, cutthroat trout, brook trout, mountain whitefish,sunfish, arctic grayling

* In some lakes, even smaller Walleye have relatively high levels of mercury–check Tables 1 & 2 in the Guideline Document.

For more information:

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For informtion on any part of this publication, contact the Montana Department of Public Health and Human Services, Food & Drug Program Office at (406) 444-5306.